REVISED AND ENLARGED EDITION.

SHORT METHODS

FOR

COMPUTING

INTEREST AND DISCOUNT.

100 DAYS INTEREST METHOD.

SIMPLE INTEREST, BANK DISCOUNT, COMPOUND INTEREST.

BY

HENRY GOLDMAN,

AUTHOR OF THE 'ARITHMETICAL DETECTOR.'

"100 DAYS AVERAGE METHOD," "COMBINATION DISCOUNT CALCULATOR" ETC.

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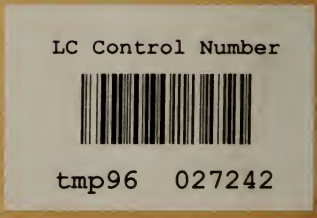

PREFACE.

Accuracy and speed in computing interest and discount are important accomplishments; that they are so rarely found proves to a great extent the deficiency of the methods hitherto introduced.

The author offers in the following pages a method, pronounced by experts as the shortest and simplest interest method known, and which, according to his own judgment, leaves nothing to be desired. It can be easily acquired and when once learned is hardly ever to be forgotten. Being applicable to all cases that may possibly arise, it is bound to win its way into general use.

For Bank Discount no more satisfactory method has ever been invented. Based on a strictly scientific principle, it combines all the advantages of the so-called Table methods, without sharing any of their faults. The time required for opening the table and looking for page etc., is more than sufficient to ascertain the result by this new method, saving time and inconvenience. As another advantage the author claims that errors resulting from the neglect of fractions, which in the aggregate of many items may cause a considerable difference, are practically avoided by the reduction of the high rate of 36% to any given rate, decreasing all differences from three to twelve times. The consideration of the tens of the cents of the principal, whenever the number of days exceeds 100, is another of the many good features of this method, while the thorough application of the decimal principle places it at the head of all methods previously taught.

This pamphlet contains also a simplified rule for ascertaining the present value of a note, an improved method for compound interest, etc.

A fair trial of the methods herein given will convince even the most skeptical of their excellence.

THE AUTHOR.

INTEREST

Is a compensation for the use of money; PRINCIPAL, the money on which Interest is computed; RATE, the number of per cent., and AMOUNT, the sum of Principal and Interest.

100 DAYS INTEREST METHOD.

To obtain the interest for 100 days, 10 days, or 1 day, divide the principal by one of the divisors of the following table, according to the Rate, and add or deduct, if necessary, the part which the corresponding column indicates.

The divisors for the most frequent rates can be remembered without difficulty, being the result of 36 divided by the given rate. The division of the principal is carried out to the tens of the cent; two places of the result are pointed off as cents, the remaining figures represent dollars of interest for 100 days.

The interest for any desired number of days can be easily found by multiplying the hundreds, tens, or units of days by the corresponding amount of interest and adding these products together.

If the number of days is between 90 and 100, deduct from the interest for 100 days as many times the interest for 1 day as there as there are days less. The interest for 9 days equals the interest for 10 days less the interest for one day. 25 days interest is one quarter of a hundred days interest, etc.

TABLE.

RATES.	DIVISORS.	PARTS.	
Per cent.	Divide by	To be added.	To be deducted.
1	36		
2	18		
3	12		
3½	12	One sixth.	
4	9		
4½	8		
5	6		One-sixth.
5½	6		One-twelfth.
6	6		
6½	6	One-twelfth.	
7	6	One-sixth.	
7½	6	One-quarter.	
8	6	One-third.	
8½	4		One-eighteenth.
9	4		
9½	4	One eighteenth.	
10	3		One-sixth.
11	3		One-twelfth.
12	3		

EXAMPLES.

1. $763·—at 6 % for 93 days?

6)763.00

12·71 = Interest at 6% for 100 days.

0·127×7 = 89 = " " " 7 "

Answer, $11·82 = Interest at 6% for 93 days.

2. $136·43—at 8% for 112 days?

6(136·43

2·27 = Interest at 6% for 100 days.

+⅓ 76 = " 2% " "

$3·03 = Interest at 8% for 100 days.

0·303×1 = 30 = " " 10 "

0·030×2 = 6 = " " 2 "

Answer, $3·39 = Interest at 8% for 112 days.

If the time is given in months, reduce first to days, figuring the month at 30, or at the exact number of days. Interest for years should be computed separately by multiplying the principal by the product of the rate and number of years.

BANK DISCOUNT.

Any principal showing its own interest at 36% for 100 days, 10 days, or 1 day by removing the decimal point 1, 2 or 3 places to the left, the interest for any given number of days at 36% can be easily found by multiplying the interest on each note for 1, 10 or 100 days by the units, tens or hundreds of the corresponding number of days. These products, added together form the Interest or Bank Discount on all notes at 36%.

To obtain the interest at any given rate, divide the sum of the products by one of the divisors of the table (page 5), according to the rate, and add or deduct the part which the corresponding column indicates.

NOTE. The dollars of any principal show the interest in cents for 10 days at 36%. Ten times the interest for 10 days represent the interest for 100 days, and one-tenth of it the interest for 1 day.

In computing interest the fractions of cents must be taken in consideration. For instance: he interest on $345.63 at 36%, For 100 days is $34.56, 10 days $3.46, 1 day 35c.

EXAMPLE.

Bank Discount on the following notes at 7%?

$360.00 for 16 days	3.60 2.16
72.18 " 29 "	1.44 .65
129.36 " 34 "	3 88 .52
87.50 " 80 "	7.00
40 29 " 112 "	4.03 .40 8
	6)23.76
Interest at 6 %	3.96
" " 1 % + $\frac{1}{6}$	.66
Answer: Interest at 7 %	$4.62

PRESENT WORTH.

To ascertain the Principal which at a given rate and in a given number of days, produces a given amount.

Multiply one-sixth of the rate by one-sixth of the number of days, remove the decimal point three places to the left, add one unit to the product, and divide the given amount by this sum.

EXAMPLE.

Present Worth of $1000, due in 93 days, Rate 6%?

6)93 6)6(1

1,015·5)1000 00(984·73, Answer.

86050

48100

74800

37150

To ascertain the Amount which after deducting the Interest or bank discount at a given rate and for a given number of days, leaves a given principal.

Apply the rule stated above, with the deviation that instead of adding one unit to the product, subtract the product from one unit, and substitute for the unknown amount the given principal.

COMPOUND INTEREST

is the interest on the sum of a given principal and its interest, added in certain intervals, either annually or semi-annually.

The compound interest of $1.00 from one to ten years can be obtained by multiplying successively the rate, squared rate, cubed rate, etc., by the factors of the following table, according to the number of years, placing each following product two places to the right under the one preceding, and finding their total.

COMPOUND INTEREST FACTORS.

Years.	.Rate.	.Rate^2×0·01	.Rate^3 ×0·0001	.Rate^4 - ×0·000001	.Rate^5 - - ×0·00000001	.Rate^6 - - - ×0·0000000001	.Rate^7 - - - - ×0·000000000001	.Rate^8 - - - - - ×0·00000000000001	.Rate^9 - - - - - - ×0·0000000000000001	.Rate^{10} - - - - - - - ×0·000000000000000001
1	1									
2	2	1								
3	3	3	1							
4	4	6	4	1						
5	5	10	10	5	1					
6	6	15	20	15	6	1				
7	7	21	35	35	21	7	1			
8	8	28	56	70	56	28	8	1		
9	9	36	84	126	126	84	36	9	1	
10	10	45	120	210	252	210	120	45	10	1

NOTE.—These factors can be easily retained, being the members of progressions which stand in obvious relations to each other.

EXAMPLE.

Compound Interest on $1, for 4 years at 5%?

5×4=20. .
25×6= 150. .
125×4= 500. .
625×1= 625

$0·21550625=Answer.

It is sufficient for all practical purposes to go only as far as the 3rd power of the rate.

To ascertain the compound interest on any given principal, multiply the same by the compound interest of $1.00.

Compound interest can also be computed semi-annually which is equivalent to the annual compound interest for twice the number of years at half the rate.

To find, approximately, the number of years in which any principal doubles itself by the accumulated compound interest, divide 72 by the given rate.

ANNUITIES.

To find the annuity with which to pay $1 in a given number of years, divide the rate by the compound interest, add the rate to the quotient, and remove the decimal point two places to the left.

EXAMPLE.

Annuity to pay $1 in 4 years, at 5% ?

Compound Interest, 0·2155) 5000 (23·20
6900
4350
40
5
·2820=Annuity.

To find the amount to which an annual investment of $1 will accumulate, divide the compound interest at the given rate and for the given number of years by the rate, and remove the decimal point two places to the right.

EXAMPLE.

$1 annual investment for 4 years at 5% ?

5)0·2155, Compound Interest.

$4·31, Accumulated Amount.

The results obtained for $1 can be applied to any amount by simple multiplication.

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